

CLAIMS

1. A control system for an internal combustion engine provided with a plurality of cylinders, introducing air into an intake passage part extending from a throttle valve to an intake valve through the throttle valve in exactly a throttle valve air passage amount, and discharging air from the intake passage part through an intake valve in exactly a cylinder air filling amount to fill a cylinder at the time of an intake stroke,

wherein the cylinder air filling amount is divided into a first amount of air and a second amount of air, the first amount of air being an excess of a cylinder air filling amount with respect to a throttle valve air passage amount occurring due to an intake stroke,

wherein the control system comprises an intake pressure drop detecting means for detecting a drop in intake pressure occurring due to an intake stroke being performed, for each cylinder,

a first air amount calculating means for calculating the first amount of air for a cylinder based on its intake pressure drop;

a throttle valve air passage amount detecting means for detecting a throttle valve air passage amount;

a second air amount calculating means for calculating the second amount of air for a cylinder based on the throttle valve air passage amount;

a cylinder air filling amount calculating means for totaling the first amount of air and the second amount of air to calculate the cylinder air filling amount for a cylinder; and

a control means for controlling the engine based on the cylinder air filling amount of the cylinder,

and wherein the first air amount calculating means sets a set crank angle range so as to

5 include the intake strokes of at least two cylinders for which cylinder air filling amounts are to be calculated, calculates the total value of the intake pressure drop of the cylinders performing an intake stroke in the set  
10 crank angle range, and calculates the first amount of air based on each intake pressure drop and the intake pressure drop total value.

15 2. A control system for an internal combustion engine as set forth in claim 1 wherein, when backflow of air from inside a cylinder to the intake passage part occurs at the end of an intake stroke, the action of the second air amount calculating means calculating the second amount of air is prohibited.

20 3. A control system for an internal combustion engine provided with a plurality of cylinders and a plurality of intake valves,

25 wherein the cylinder air filling amount to a cylinder is divided into a basic amount of air and an excess amount of air flowing from an intake passage part to the inside of the cylinder exceeding a throttle valve air passage flow rate due to opening of an intake valve,

30 wherein the control system comprises a basic air amount calculating means for calculating a basic air amount based on a throttle valve air passage flow rate of air flowing into the intake passage part through the throttle valve and the opening time of each intake valve;

35 an excess air amount calculating means for calculating an excess air amount based on the drop in intake pressure due to opening of said intake valve;

40 a cylinder air filling amount calculating means for totaling said basic air amount and excess air amount to calculate a cylinder air filling amount to a cylinder; and

45 a control means for controlling the engine based on the cylinder air filling amount to a cylinder, and wherein said basic air amount

calculating means calculates a virtual intake valve opening time so that the average air flow rate to all cylinders becomes equal to the throttle air passage flow rate and uses said virtual intake valve opening time as the opening time of an intake valve.

4. A control system as set forth in claim 3, wherein said basic air amount calculating means uses said virtual intake valve opening time as the opening time of an intake valve when backflow of air to the intake passage part occurs near the intake valve opening timing or near the intake valve closing timing.